

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

RESIDUE MANAGEMENT, NO TILL AND STRIP TILL

(Acre)
Code 329A



DEFINITION

Managing the amount, orientation and distribution of crop and other plant residues on the soil surface year-round, while growing crops in narrow slots or tilled strips in previously untilled soil and residue.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Reduce sheet and rill erosion.
- Reduce wind erosion.
- Maintain or improve soil organic matter content.
- Conserve soil moisture.
- Provide food and escape cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown.

This standard includes tillage and planting methods commonly referred to as no till, zero till, slot plant, row till, zone till, or strip till.

CRITERIA

General Criteria Applicable to All Purposes Named Above

Loose residues to be retained on the field, shall be uniformly distributed on the soil surface. Where combines or similar equipment are used for harvesting, they shall be equipped with spreaders capable of distributing residue over at least 80 percent of the working width of the header.

Planters or drills shall be equipped to plant directly through untilled residue or in a tilled seedbed prepared in a narrow strip along each row by planter attachments such as rotary tillers, sweeps, multiple coulters, or row cleaning devices.

Residues shall not be burned, or disturbed by tillage operations except as follows:

1. Seedbed preparation, planting, and fertilizer placement shall disturb no more than one-third of the row width. The row area formed shall be level with or slightly above the adjacent row middles unless the rows are planted on the contour.
2. If row cultivation or spot treatment for weed escapes, leveling ruts, or similar operations become necessary, tillage shall be limited to undercutting operations which minimize burial of surface residue.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Additional Criteria to Reduce Sheet and Rill Erosion

The amount of residue needed to reduce erosion within the soil loss tolerance (T) or other planned soil loss objective meeting quality criteria in Field Office Technical Guide (FOTG) Section III, shall be determined using the Revised Universal Soil Loss Equation (RUSLE) in the Florida Agronomy Field Handbook (FAFH).

Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Reduce Wind Erosion

The amount and orientation of residue needed to reduce erosion within T, air quality or other planned soil loss objective shall be determined using wind erosion prediction technology such as the Wind Erosion Equation (WEQ). Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Maintain or Improve Soil Organic Matter Content

The amount of residue needed to achieve the desired soil condition, shall be determined using the current approved soil conditioning index procedure in the FAFH. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Conserve Soil Moisture

A minimum quantity of 50 percent residue cover shall be maintained throughout the year. Residue shall be evenly distributed and maintained on the soil surface.

Additional Criteria to Provide Food and Escape Cover for Wildlife

Residue height, amount, and time period shall be determined using the habitat evaluation procedure in the National Biology Manual.

Residues shall not be removed unless it is determined by the habitat evaluation procedure that removal would not adversely affect habitat values.

CONSIDERATIONS

No till or strip till may be practiced continuously throughout the cropping sequence, or may be managed as part of a system which includes other tillage and planting methods such as mulch till. Selection of acceptable tillage methods for specific site conditions may be determined by using data from RUSLE.

Production of adequate amounts of crop residues necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and row spacing.

Partial removal of residue by means such as baling or grazing will be limited to retain the amount of residue needed for the designed purpose(s).

Maintaining a continuous no till system will maximize the improvement of soil organic matter and soil organic carbon content. Also, when no till is practiced continuously, soil reconsolidation provides additional resistance to sheet and rill erosion.

The value of residues for wildlife habitat can be enhanced by leaving rows of unharvested crop standing at intervals across the field.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation. Procedures and examples of these records are in the FAFH.

- **No-Till**

It is considered no-till when the crop is planted in undisturbed soil, with at least 60 percent of the soil surface covered by crop residue immediately after planting. The soil is left undisturbed from harvest to planting except for nutrient injection and/or seeding of cover crops. See Florida NRCS Conservation Practice, Cover Crop, Code 340.

Crop residue is left on the surface from the prior crop. It may be shredded in the fall, winter or spring prior to planting or may be left unshredded. If the current crop residue is to be used (harvested), or it is not adequate to provide the needed cover, a cover crop can be used to provide the needed cover.

The seedbed, usually 1 to 3 inches wide, is prepared by breaking the soil with a coultter, single chisel, or similar tool. Seedbed preparation and planting are done in one operation. Herbicides are normally used to control weeds.

- **Strip-Till**

It is considered strip-till when the crop is planted in a narrow, cultivated band, no more than one-third of the row width. The soil within the strips is disturbed by a planter that has been modified by adding multiple coultters and/or cleaners to remove more crop residue and create strips of bare or deep-tilled (using an in-row subsoil shank) soil. The field will have a minimum of 30 percent of the soil surface covered by crop residue immediately after planting. Generally, strip-till is not used when row spacing is less than 30 inches.

- **No-Till/Strip-Till Procedures**

The percent of the soil surface covered will be in accordance with the definition of this practice. Residue will be from the previous crop, cover crop, winter/summer weeds or a combination of cover types.

In the case of no-till and strip-till, injecting or knifing-in anhydrous or liquid fertilizer prior to planting is permissible. See Florida NRCS Conservation Practice, Nutrient Management, Code 590.

Where pesticides are used, target them to specific problems. Pesticides will be used in accordance with the manufactures' label. Refer to University of Florida, Institute of Food and Agriculture Science (UF, IFAS) Circular Numbers 959 – 1015 for recommendations. See Florida NRCS Conservation Practice, Pest Management, Code 595.

OPERATION AND MAINTENANCE

No operation and maintenance requirements have been identified for this practice.

REFERENCES

Wind Erosion Equation
 Revised Universal Soil Loss Equation
 Florida Agronomy Field Handbook
 National Biology Manual
 NRCS FOTG, Section III
 NRCS Conservation Practice Standards:
 Cover Crop, Code 340
 Nutrient Management, Code 590
 Pest Management, Code 595
 UF, IFAS Circular Numbers 959 - 1015